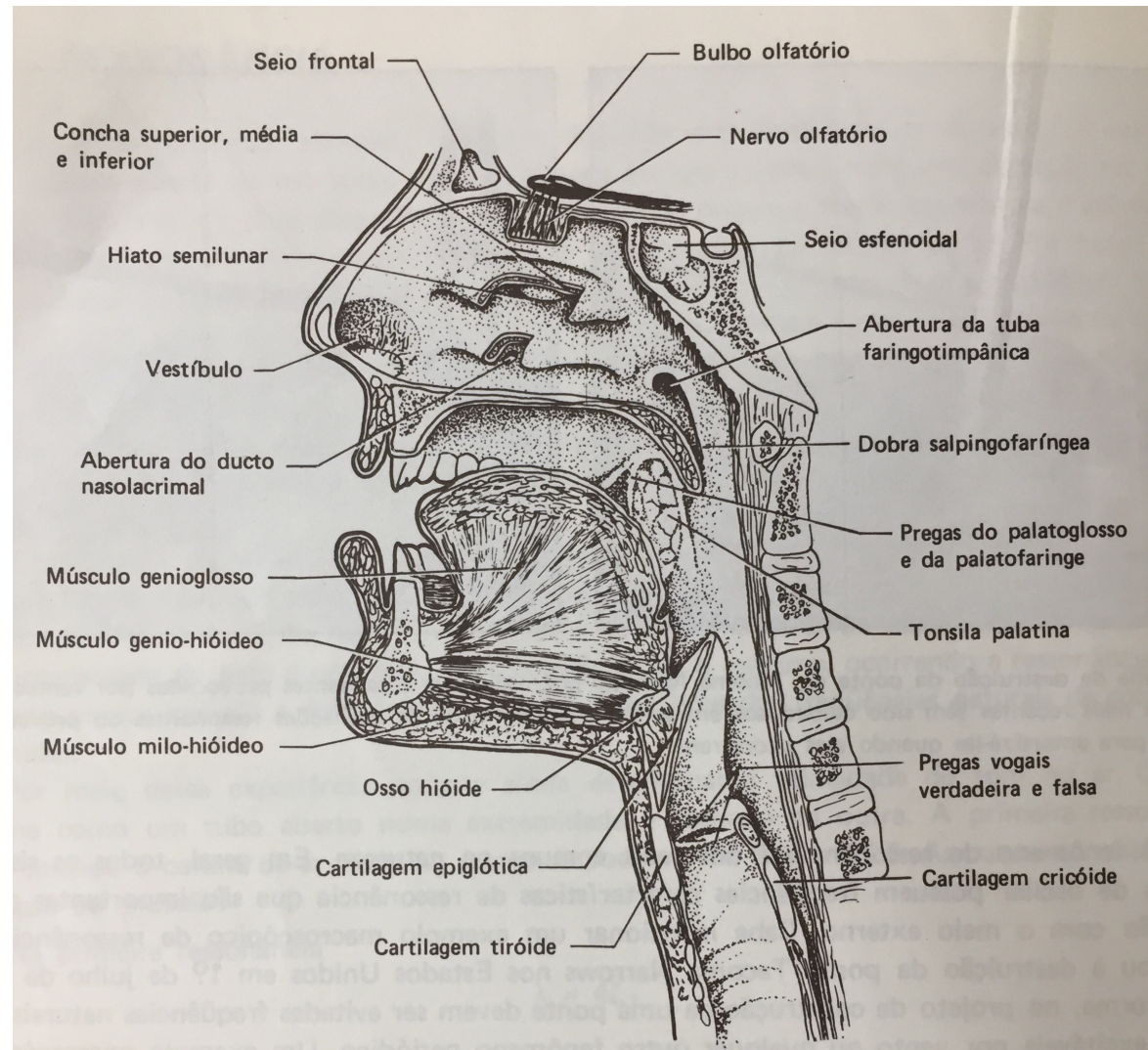
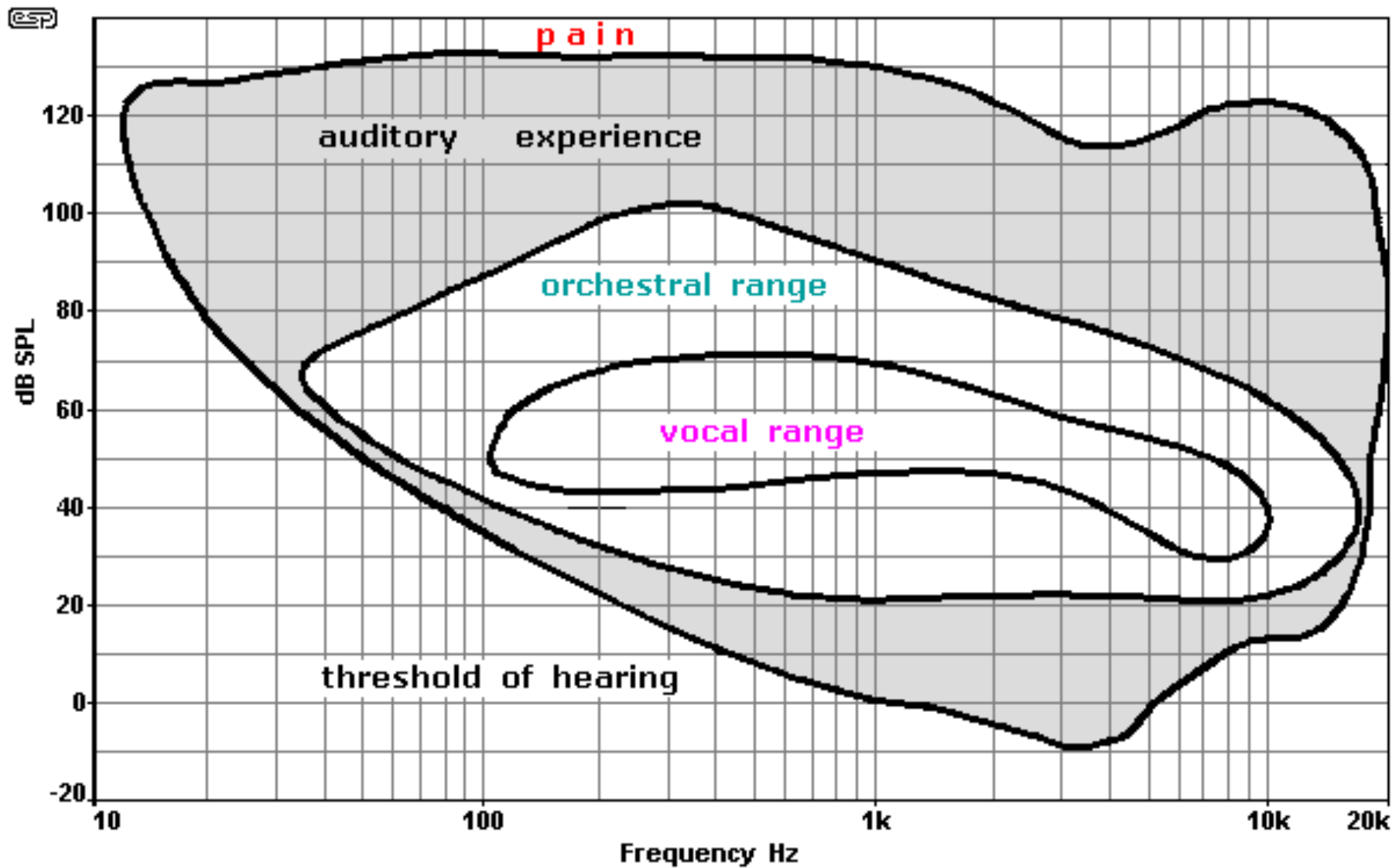


Física do sistema fonador



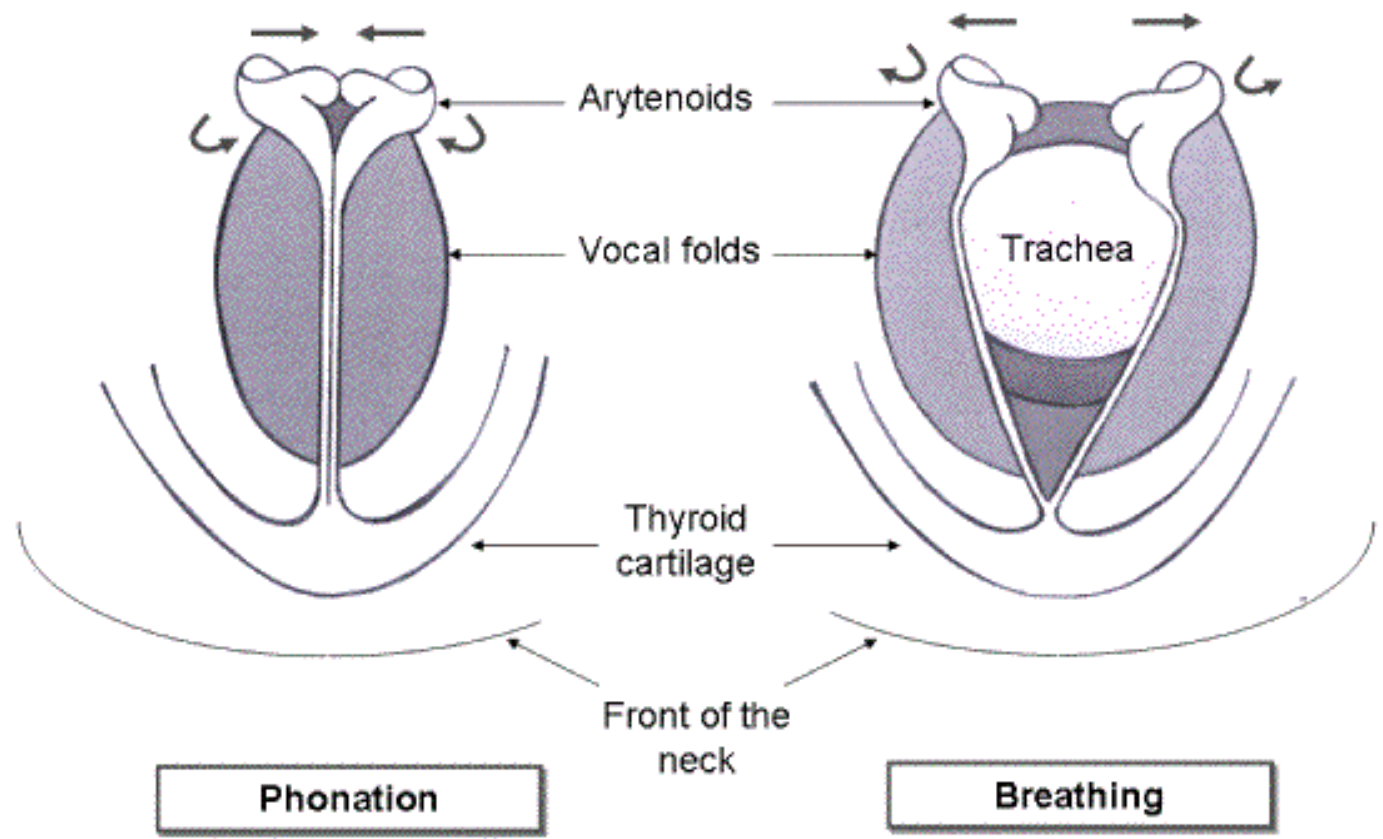


Frequência fundamental:

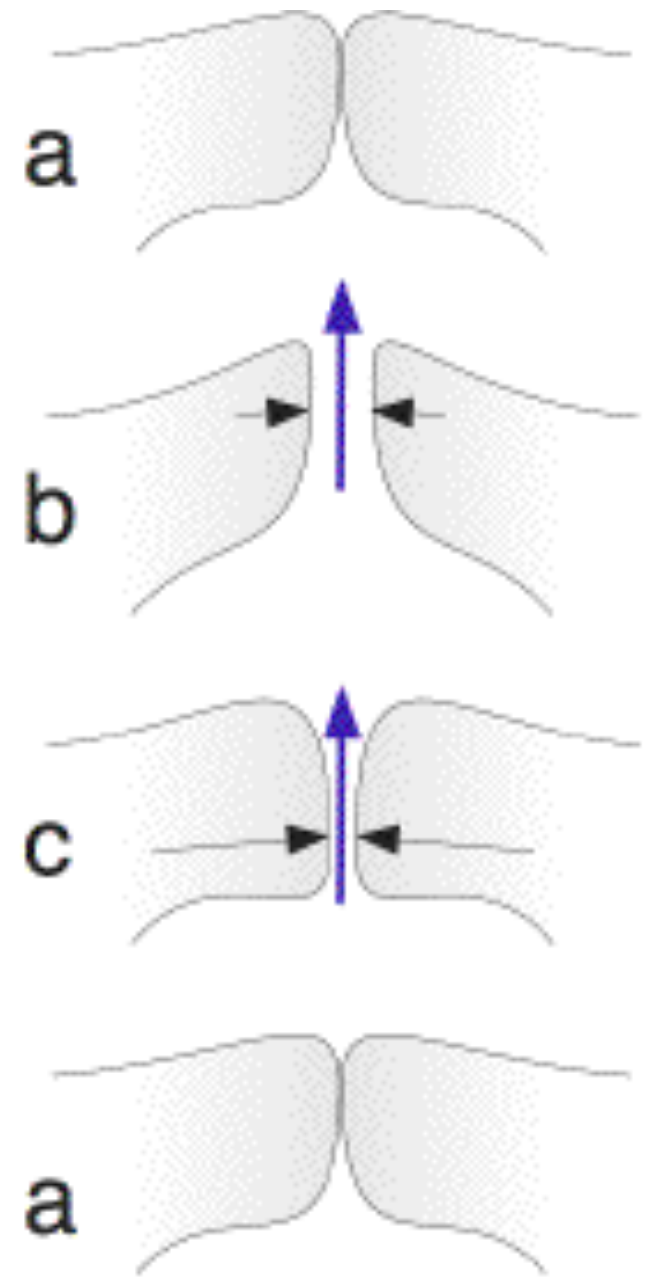
Homens 106 Hz, com range entre 77 Hz e 482 Hz.

Mulheres, 193 Hz, com range entre 137 Hz to 634 Hz.

Stemple, J. C., Glaze, L. E., Gerdeman-Klaben, B., Clinical Voice Pathology, Theory and Management, 3rd Ed., Canada: Singular Publishing Group (2000).



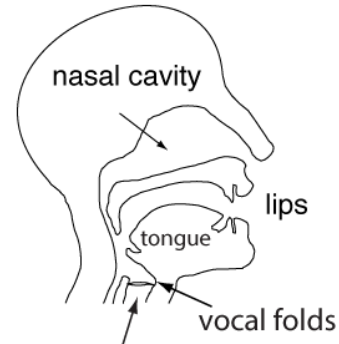
Efeito Bernouli



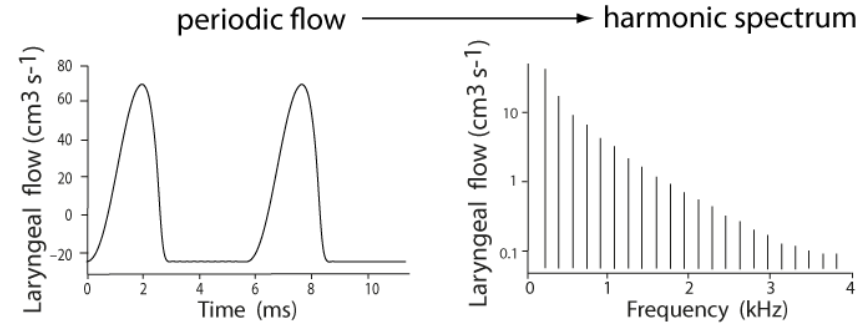
Modelo fonte-filtro para produção do som da voz

SOURCE

The vocal folds undergo auto-oscillation and produce a pulsed laryngeal flow through the glottis, the oscillating gap between the folds

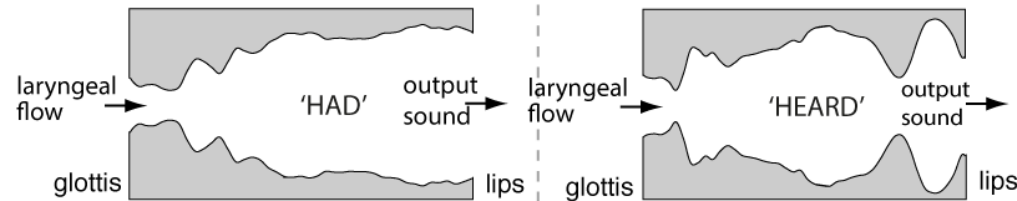


steady airflow from lungs via trachea provides energy source

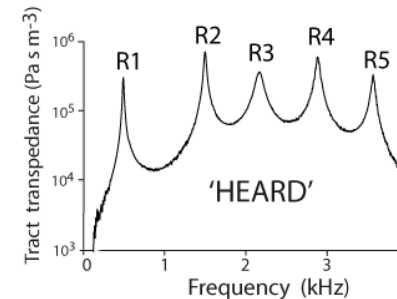
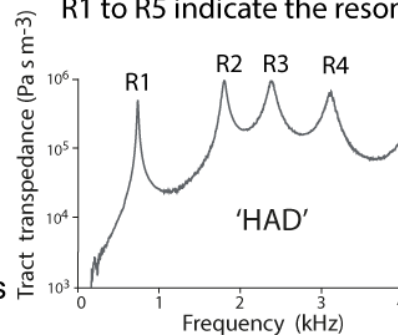
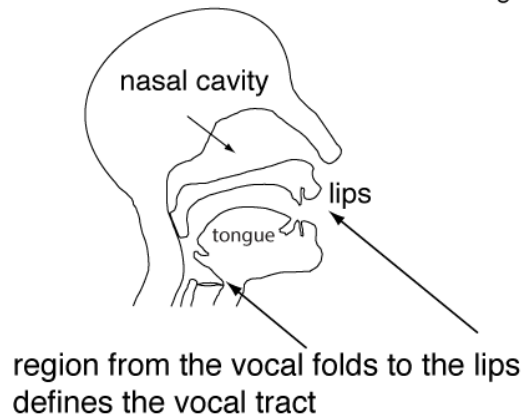


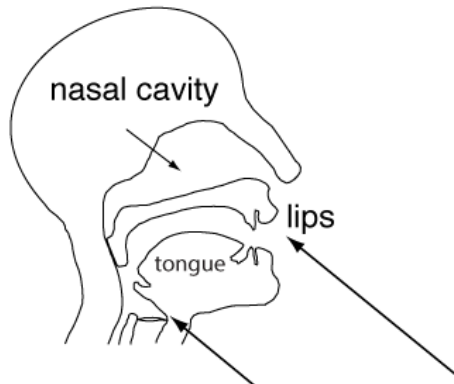
The periodic laryngeal flow then enters the downstream vocal tract
Two different configurations show how the radius varies with distance along the tract. They correspond to the vowels in 'had' and 'heard'.

FILTER



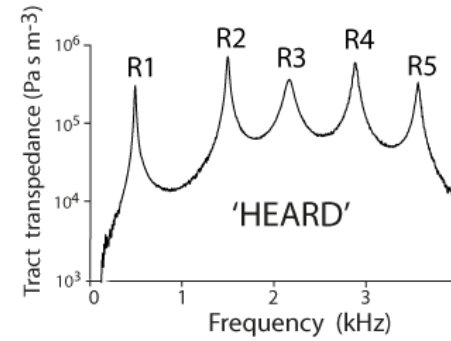
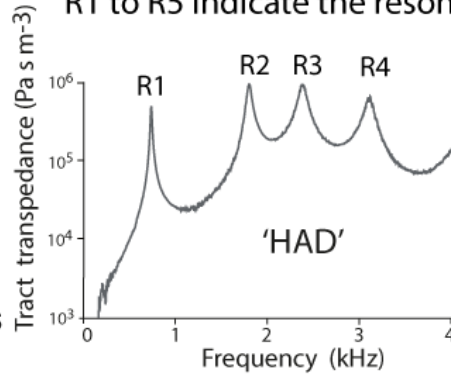
The 2 vocal tract models have the measured transpedances shown below.
R1 to R5 indicate the resonances of the tract





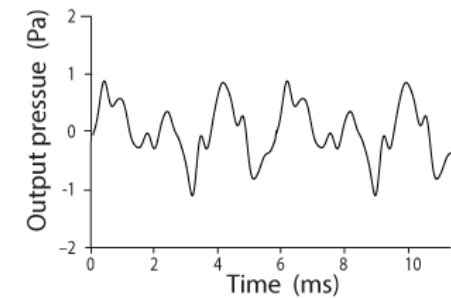
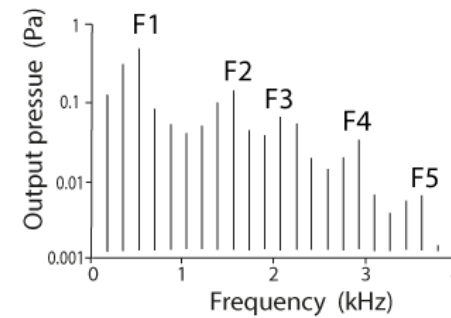
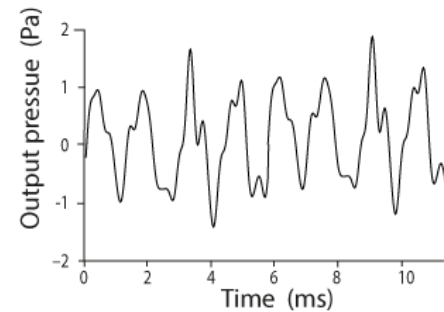
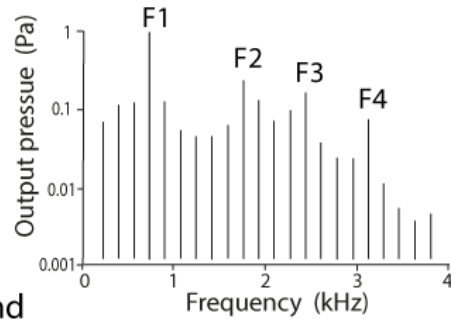
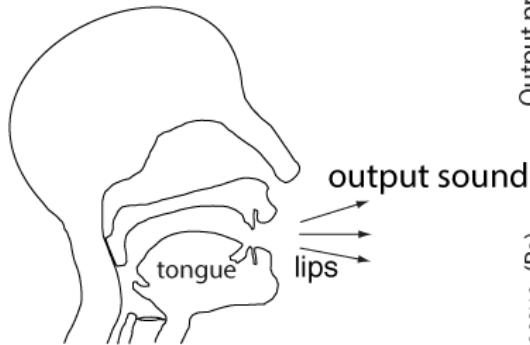
region from the vocal folds to the lips defines the vocal tract

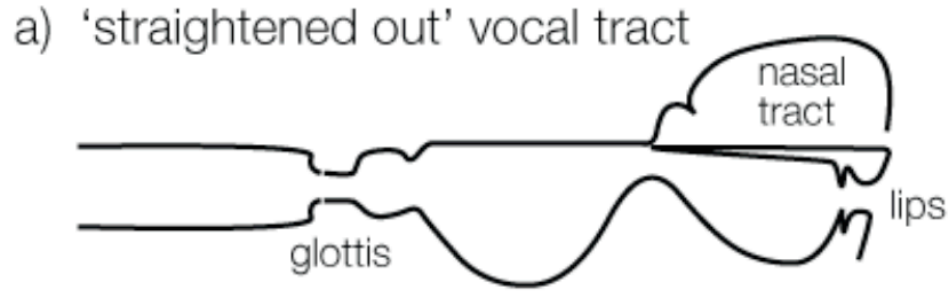
The 2 vocal tract models have the measured transpedances shown below. R1 to R5 indicate the resonances of the tract



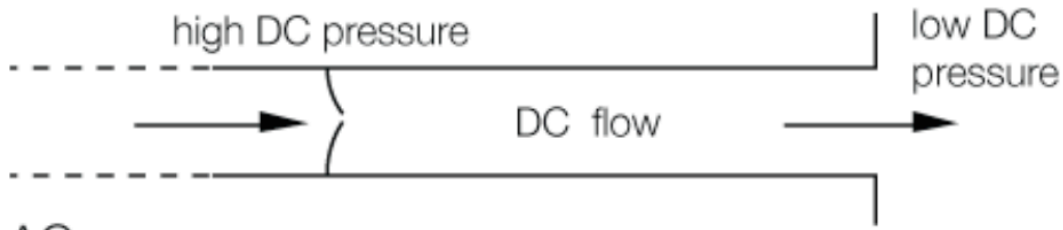
In a linear system the output sounds are the product of the source function and the filter function and will have the pressure spectra and waveforms shown below

OUTPUT SOUND





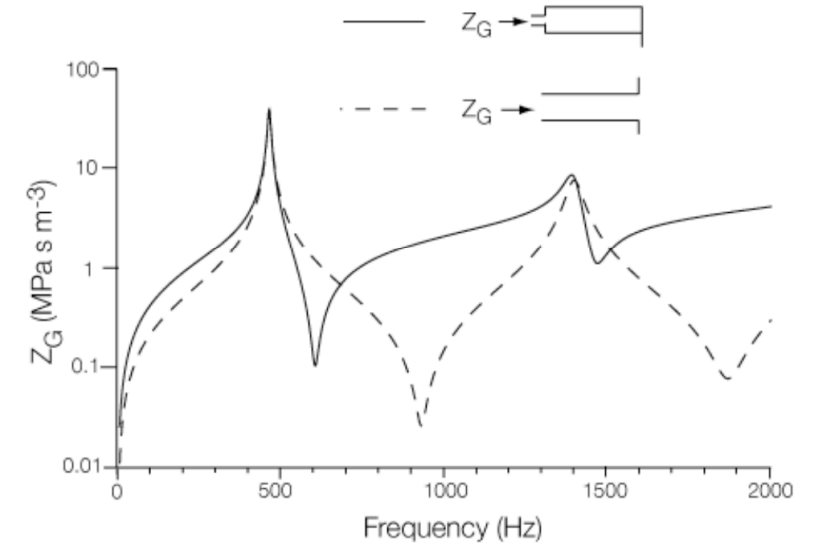
DC flow



AC waves



c) calculated impedance spectra



d) calculated transfer functions

